

UNICO TURBO FLG FREE: Packaged air cooled liquid chillers with free-cooling system in “A” class energy efficiency for outdoor installation, equipped with oil-free centrifugal compressors with magnetic levitation bearings, flooded evaporator, microchannel condensing coils and free-cooling coils.

Cooling Capacity: 400 ÷ 1260 kW

Free-Cooling Capacity: 497 ÷ 1492 kW



NEW PRODUCT

RC Hi-Tech

FREE COOLING

RC Hi-Tech

HIGH EFFICIENCY

RC Hi-Tech

INVERTER

RC Hi-Tech

A CLASS

RC Hi-Tech

LOW NOISE

RC Hi-Tech

LOW GWP

RC Hi-Tech

GO GREEN solutions

UNICO TURBO FLG FREE

rcgroupairconditioning



MAIN FEATURES

- Air cooled liquid chiller with free-cooling system in A class energy efficiency.
- 9 models, 2 versions available for a wide selection opportunity.
- Average step of 100kW.
- EER up to 3,50.
- ESEER up to 5,60.
- Oil-free centrifugal compressors with magnetic levitation bearings driven by built-in inverter.
- HFO1234ze refrigerant charge, LOW GWP, GWP < 6.
- Single refrigerant circuit.
- EC Axial fans.
- Flooded evaporator.
- Microchannel condensing coils in aluminium.
- Electronic expansion valve.
- Single air circuit.
- Modular construction.
- Suitable for outdoor installation.

MAIN BENEFITS

- Up to four centrifugal compressors with magnetic levitation bearings on the refrigerant circuit for an high efficiency.
- No need of power factor correction.
- Minimum starting current (LRA)
- Low refrigerant charge.
- Very high EER and ESEER. A Class energy efficiency.
- Quiet operation.
- Availability of double refrigerant circuit version.
- Availability of kit for further reduction of the noise.
- Microprocessor control system with 7" touch screen display.

- Extremely easily of maintenance.
- Complete set of components dedicated to the safety of the unity.

INDIRECT FREE COOLING SYSTEM: Complete cooling of the chilled water of the existing cooling system with the outside air. The energy saving will be higher the longer the outside temperature remains below the required temperature for cooling.

A CLASS ENERGY EFFICIENCY: The best and most accurate components applied to the chillers.

WORKING LIMITS IN COOLING MODE

Chilled water outlet temperature: 5÷15°C
Ambient temperature: -20÷45°C

WORKING LIMITS IN FREE-COOLING MODE

Minimum chilled water outlet temperature: 5°C
Minimum ambient temperature: -20°C





COMPONENTS

FRAMEWORK

- Base, self supporting frame and panelling in steel plate with protective surfaces treatment in compliance with UNI ISO 9227/ASTMB117 and ISO 7253, and painted with epoxy powders.
- Colour: RAL 9002 textured.

COMPRESSORS

- Twin-turbine centrifugal compressor, oil-free type, optimized for HFO1234ze refrigerant. The term "oil-free" refers to the total absence of lubricating oil within the compressor
- Magnetic levitation bearings.
- Manometric compression ratio: $1.5 \div 5.0$.
- Stepless capacity control through integrated inverter.
- High efficiency permanent-magnet synchronous motor with integrated Soft-Start system (starting current limited to 5A).
- Power factor motor $\cos\phi > 0.9$ for a large part of the operating range.
- Motor and electronic power section cooling by liquid refrigerant injection into the integrated cooling circuit.
- Electric motor thermal protection via internal winding temperature sensors.
- Electronic integrated control for operation and alarms status.
- Sensor on refrigerant discharge for temperature monitoring.
- Inner sensors for electronic components and inverter temperature control.
- Security system to protect the crankshaft and magnetic bearings in the event of failure of power supply.
- Installation with walls sound attenuators.
- Degree of protection: IP54.
- Electric resistance of the suction pipe, together with activated antifreeze evaporator, to prevent the migration of refrigerant inside the compressor.

EVAPORATOR

- Flooded shell and tube evaporator, optimized for HFO1234ze refrigerant.
- Version two passes, characterized by low pressure losses on the water side.
- Water tubes with a helical rifled internal surface.
- Integrated liquid drop separator.
- Shell, header, tube sheets made of carbon steel, tubes in Cu.
- Anticondensate insulation made of polyurethane.
- Large liquid level indicator.
- Temperature sensors on water inlet and outlet.
- Water flow switch for water flow control on water outlet towards the plant, not installed but supplied in kit.
- Large liquid level indicator
- Antifreeze heater.
- Hydraulic connections with grooved end supplied as standard with flexible joint and adapter pipe to be welded.

CONDENSING COIL

- Microchannel condensing coil in aluminium perfectly suitable for the civil and industrial applications cooling, while the protection function of the oxide layer allows an optimum resistance to corrosion also in case of aggressive ambient conditions.
- Extremely light construction. The coil weight is only 50% compared to traditional copper pipes and aluminium fins of the same capacity.
- Low air side pressure drop and consequentially drastic reduction of the fans motors electric energy consumption.
- High heat exchange efficiency.
- Reduced internal volume capable of reducing the total refrigerant charge. At the same performances conditions, the micro-channels condensers require up-to less than 75% refrigerant when compared to the traditional heat exchangers.
- Single air circuit.
- Motorized valves for condenser partialization system.
- Frame in painted galvanized steel.

FREE-COOLING COIL

- Heat exchanger coil with copper tubes and high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops. The combination of two factors, special tubes and fins, allow to optimally combine the following aspects:
 - Maximum capacity relative to the size of the exchanger.
 - Reduction of the air flow required for the heat exchange.
- Frame in galvanized steel.
- Motorized valves for free-cooling water circuit control.
- Intermediate free-cooling sensor.
- Temperature sensor on ambient air.

FAN SECTION

- Axial fans with sickle-shaped blades and fan guard optimized for low noise levels designed with bionical know how.
- Optimized diffusor with static blades.
- External rotor EC type electric motor with stepless variable speed for condensing pressure control.
- IP54 enclosure class.

REFRIGERANT CIRCUIT

Components for each refrigerant circuit:

- Capacitive level sensor connected to the driver of the expansion valve.
- Electronic expansion valve that allows high performance and system efficiency and for the refrigerant level control in the evaporator.
- By-pass valve for start-up.
- Electronic by-pass valve for compressor start.
- Non return valve on by-pass line for compressor start.
- Economizer for models 520 T2E, 620 T2E, 780 T3E, 900 T3E, 1040 T4E, 1200 T4E, 1300 T4E. The system includes:
 - Copper brazed plate type with cover plates, plates and connections in AISI 316 stainless steel.
 - Anticondensate insulation made of polyurethane.
 - Intermediate electronic expansion valve.
- Sight glass.
- Filter dryer on liquid line.
- Service valve on liquid line.
- Service valve on gas suction and discharge.
- Non return valve on gas discharge.
- Safety valve on low pressure side.
- Safety valve on high pressure side.
- Pressure transducers with indication, control and protection functions, on low and high refrigerant pressure.
- High pressure safety switch with manual reset.
- Refrigerant circuit with copper tubing with anticondensate insulation of the suction line.
- Plastic capillary hoses for pressure sensors connection and cooling line of the compressor
- HFO1234ze refrigerant charge.

ELECTRICAL PANEL

In accordance with EN60204-1 norms, suitable for outdoor installation, complete with:

- Main switch with door lock safety.
- Fuses for each compressor.
- Magnetothermic switches for fans or water pumps (if scheduled).
- Contactors for each load.
- Transformer for auxiliary circuit and microprocessor supply.
- Panel with machine controls.
- Power supply 400/3/50.

CONTROL SYSTEM

- Microprocessor system with "Touch Screen" graphic display for control and monitor of operating and alarms status. The system includes:
 - Voltage free contact for remote general alarm.
 - Voltage free contact for external alarm. The inlet is associable with refrigerant gas leak detector (optional accessory).
 - Main components hour-meter.
 - Recording of the last 24 occurred alarms.
 - Non-volatile "Flash" memory for data storage.
 - Menu with protection password.



OPTIONAL ACCESSORIES

UNICO TURBO FLG FREE SIZE	400 T2 VT4	520 T2E VT5	620 T2E VT6	700 T3 VT7	780 T3E VT7	900 T3E VT8	1040 T4E VT9	1200 T4E VT11	1300 T4E VT12
150 - LNO kit (noise reduction)	•	•	•	•	•	•	•	•	•
Active filters for containment of the harmonic distortion	•	•	•	•	•	•	•	•	•
172 - Rubber support (kit)	•	•	•	•	•	•	•	•	•
79 - Electrical panel heating system	•	•	•	•	•	•	•	•	•
179 - Double refrigerant circuit	•	•	•	•	•	-	-	-	-
350 - Kit TK PRO corrosion resistant painting treatment	•	•	•	•	•	•	•	•	•
351 - Free-cooling coils with pre-painted fins	•	•	•	•	•	•	•	•	•
1003 - Analogic flowmeter	•	•	•	•	•	•	•	•	•
1005 - Power supply analyzer	•	•	•	•	•	•	•	•	•
1009 - Multimeter kit	•	•	•	•	•	•	•	•	•
Refrigerant gas leak detector	•	•	•	•	•	•	•	•	•
943 - Data Logger	•	•	•	•	•	•	•	•	•
923 - RC-Com MBUS/JBUS Serial board	•	•	•	•	•	•	•	•	•
926 - LON Serial board	•	•	•	•	•	•	•	•	•
931 - BACnet Ethernet - SNMP - TCP/IP Serial board	•	•	•	•	•	•	•	•	•
932 - BACnet MS/TP Serial board	•	•	•	•	•	•	•	•	•
942 - Serial card for GSM Modem	•	•	•	•	•	•	•	•	•
962 - Kit modem GSM	•	•	•	•	•	•	•	•	•
957 - Plantwatch without modem	•	•	•	•	•	•	•	•	•
930 - Remote graphic terminal kit	•	•	•	•	•	•	•	•	•
889 - Master plant SEQUENCER	•	•	•	•	•	•	•	•	•
RC CLOUD PLATFORM	•	•	•	•	•	•	•	•	•

• available accessory; - not available accessory

TECHNICAL DATA UNICO TURBO FLG FREE

UNICO TURBO FLG FREE		400 T2	520 T2E	620 T2E	700 T3	780 T3E	900 T3E	1040 T4E	1200 T4E	1300 T4E
SIZE		VT4	VT5	VT6	VT7	VT7	VT8	VT9	VT11	VT12
STANDARD	Cooling capacity (1)	kW	400	520	620	700	780	900	1040	1260
	Unit power input	kW	122,8	146,3	179,5	206,6	221,6	261,6	297,0	364,7
	Free-Cooling capacity (2)	kW	497	621	746	870	870	994	1119	1492
	Total water flow rate (*)	m³/h	73,5	95,5	113,9	128,6	143,3	165,3	191,1	231,5
	Total pressure drop (*)	kPa	66	58	71	54	65	80	76	96
	Compressors		centrifugal	centrifugal	centrifugal	centrifugal	centrifugal	centrifugal	centrifugal	centrifugal
	Quantity	n.	2	2	2	3	3	3	4	4
	Cooling capacity control (6)	%	15%...100%	14%...100%	14%...100%	10%...100%	10%...100%	10%...100%	7%...100%	7%...100%
	Axial fans	n.	8	10	12	14	14	16	18	24
	Total air flow	m³/h	190000	237500	285000	332500	332500	380000	427500	570000
STANDARD	Air circuits	n.	1	1	1	1	1	1	1	1
	Refrigerant		HFO1234ze	HFO1234ze	HFO1234ze	HFO1234ze	HFO1234ze	HFO1234ze	HFO1234ze	HFO1234ze
	Total refrigerant charge (optional excluded)	kg	190	216	224	360	360	368	469	493
	Gas circuits	n.	1	1	1	1	1	1	1	1
	Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
	Max unit operating current (FLA)	A	352	361	370	537	537	546	713	741
	Unit starting current (LRA)	A	40	49	58	67	67	75	84	102
	EER (1)	kW/kW	3,20	3,50	3,39	3,34	3,47	3,38	3,44	3,43
	ESEER		4,62	5,07	5,52	4,83	5,12	5,51	5,07	5,43
	Sound power level [Lw] (3)	dB(A)	94,8	95,6	96,4	97,1	97,1	97,8	98,2	99,5
STANDARD	Average sound pressure level [LPm] (4)	dB(A)	74,8	75,1	75,4	75,7	75,7	76,1	76,1	76,5
	Net weight	kg	3742	4471	5065	6336	6431	7005	8588	9736
	Hydraulic connections									
	Evaporator IN/OUT - OD (5)	Ø mm	168,3	168,3	168,3	168,3	168,3	168,3	219,1	219,1

1. Referred to glycol solution temperature 15/10°C; 20% Ethylene glycol solution; ambient temperature 35°C. Fouling factor of the exchangers 0,018 m²°K/kW.
 2. Referred to glycol solution inlet temperature 15°C; 20% Ethylene glycol solution; ambient temperature 0°C. Fouling factor of the exchangers 0,018 m²°K/kW.
 3. Sound power level [Lw] according to ISO EN 9614 – 2.
 4. Average sound pressure level [LPm] 1m far according to ISO EN 3744.
 5. Hydraulic connection with grooved end, supplied as standard with flexible joint and adapter pipe.
 6. Referred to ambient air temperature at 18°C.
- (*) Referred to the entire unit: evaporator + free-cooling system.

DIMENSIONS (mm)

SIZE VT

	a	b	c
VT4	4880	2260	2370
VT5	5994	2260	2370
VT6	7114	2260	2370
VT7	8234	2260	2370
VT8	9354	2260	2370
VT9	10468	2260	2370
VT11	12708	2260	2370
VT12	13828	2260	2370

